Amendments to the Specification:

Please replace the paragraph beginning on line 15 of page 7 with the following amended paragraph:

Embodiments of the invention provide techniques for non-invasively detecting mechanical properties of tissues. For example, systems of the invention can detect tumors by determining tissue elastic modulus or stiffness (with stiffness and elasticity being related). To determine tissue elasticity/stiffness, multiple ultrasound sources transmit ultrasound beams of different frequencies into tissue such that the beams intersect at a desired location. The beams interfere with each other and produce a varying force in the tissue at the intersection. The force varies at a frequency equal to the difference of the frequencies of the beams, and causes the tissue at the intersection of the ultrasound beams to vibrate at the difference frequency. A third ultrasound source in the system sends a pulse or burst of ultrasound to the tissue at the intersection of the two beams. Echoes from reflections and scattering from the tissue due to the burst are measured. The amplitude and location of the echoes as a function of time provide information regarding the motion of the tissue and thus mechanical properties of the tissue at the intersection, in particular the elasticity/stiffness of the tissue at the intersection. The elastic modulus E and stiffness k are related to the frequency and magnitude of vibration of the tissue in the focal region, the ultrasound absorption coefficient of the tissue, the intensity of the ultrasound sources providing the intersecting beams, and the speed of sound. Multiple reflections are cross-correlated to determine the amplitude and frequency of the vibration of the tissue. Using some embodiments of the invention, elasticity/stiffness measurements may be made that are substantially immune to noise. Other embodiments are within the scope and spirit of the invention.

Please replace the paragraph beginning on line 27 of page 8 with the following amended paragraph:

The excitation signals provided by the subsystem 12 cause the transducers 18, 20 to produce RF ultrasound signals focused at the target 44 of the subject 42. Ultrasound beams from

the transducers 18, 20 are directed to focus and intersect at the target 44 in the subject 42. Ultrasound produced by the transducers is at the frequencies f_1, f_2. These frequencies are different, e.g., each of about 0.5 and about 20 MHz with a difference $f_d = f_1 - f_2$ equal to from about 10 Hz to about 5000 Hz. This produces a radiation force F_0 in the target 44 at the frequency f_d, that results in tissue motion being produced. The tissue motion produced due to the vibration at the difference frequency f_d is dependent upon various factors such as the mechanical and acoustical properties of the target region 44, The transducers 18, 20 are, manufactured such that they can produce adequate power output required for generating the tissue motion e.g. air backed transducers can be used. The subsystem 12 also provides pulse excitation signals for the diagnostic transducer 22. The pulser/receiver 24 operates the transducer 22 at a pulse/receive frequency, e.g., of about 0.5-20 MHz. For example, the transducer 22 may be driven to provide ultrasound at about an odd harmonic (e.g., third, fifth, etc.) of the set 14, e.g., if the transducers 18, 20, 22 are portions of the set 14, e.g., an array. The pulser/receiver 24 includes appropriate switching circuitry to selectively provide the transducer 22 (e.g., several adjacent transducers from the transducer array 14) with excitation pulses and to receive the RF-signals from the transducer 22. The pulser/receiver 24 is configured such that it can cause the transducer 22 to send the ultrasound pulses/bursts toward the target region 44 while the transducers 18, 20 are transmitting energy beams to the target region 44. Preferably, the transducer 22 comprises enough transducers from the set 14 to provide a well-collimated or focused beam to the target region 44. A variety of transducers may be used for the transducer 22, e.g., a transducer commonly used for diagn[[i]]ostic purposes and for example a custom-made PZT composite transducer. The diagnostic transducer 22 is also aimed at the target 44 of the subject 42 such that the pulses provided by the transducer 22 are incident upon the target region 44 that is vibrating at the difference frequency f_d. It has been discovered that echoes as a function of time from the target 44 due to the pulses/bursts from the diagnostic transducer 22 provide information regarding the tissue motion and thus mechanical properties of the target 44 substantially independently of the surroundings of the target 44. Also, it has been discovered that ~~matching~~ <u>comparing</u> measured reflections may help dissociate attenuation effects from the mechanical effects of different targets, e.g., tissues.